AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claim in the application.

Listing of claims:

1. -2. (Canceled)

3. (Withdrawn) A membrane valve as in claim 1, wherein the second means retain a first portion of the shutter disk substantially in contact with the valve seat along part of a line that is secant to said shutter disk and retain also a second portion of said shutter disk substantially in contact with said valve seat along parts of two different lines that are secant to said shutter disk.

4. -10. (Canceled)

11. (Withdrawn) A membrane valve as in claim 8, wherein the stop rib is blade-shaped, and wherein said stop rib includes two protruding extensions along opposite sides of the peripheral edge of said stop rib.

12. (Withdrawn) A membrane valve as in claim 11, wherein the two protruding extensions taper outwards and then inwards from the stop rib, said protruding extensions first flaring out of said stop rib and eventually converging again into said stop rib.

13. (Withdrawn) A membrane valve as in claim 12, wherein the first means consist essentially of one primary clamping pin extending from the shutter disk and engaged in the opening on the valve seat, and wherein the two protruding extensions essentially cover that area of said shutter disk which corresponds to said primary clamping pin.

14. (Withdrawn) A membrane valve as in claim 7, wherein the second means consist essentially of a row of secondary clamping pins, said secondary clamping pins extending from the shutter disk and said secondary clamping pins being engaged in corresponding openings on the valve seat.

15. (Withdrawn) A membrane valve as in claim 14, wherein:

the first means consist essentially of one primary clamping pin extending from the shutter disk and engaged in the opening on the valve seat;

the row of secondary clamping pins includes said primary clamping pin;

a depression surrounds said opening, said depression being completely covered by said shutter disk;

valve ribs extend radially from said opening to the edge of said depression, said valve ribs joining in a hub that encircles said opening; and

said row of secondary clamping pins is positioned on two of said valve ribs, said two valve ribs being situated in opposite positions in relation to said opening.

16. (Withdrawn) A membrane valve as in claim 14, wherein the first means consist essentially of a primary clamping pin extending from the shutter disk, and wherein the row of secondary clamping pins does not include said primary clamping pin.

17. (Withdrawn) A membrane valve comprising:

a valve seat having a continuous surface and one or two openings;

a shutter disk of flexible material surrounding said openings and having a peripheral sealing lip;

an optional annular wall extending from said valve seat and surrounding said openings, said optional annular wall creating one or more depressions around said openings, said optional annular wall being in sealing contact with said peripheral sealing lip when a gas or a liquid is not being ejected through said openings;

first means for clamping said shutter disk to said valve seat, said first means extending from said shutter disk and being engaged with each of said openings on said valve seat; and

second means for retaining two portions of said shutter disk substantially in contact with said valve seat during ejection of liquid or gas through said valve, said portion of said shutter disk being situated along two lines that are secant to said shutter disk.

18. (Withdrawn) A membrane disk as in claim 17, wherein the two lines are parallel to each other for at least part of all of their length.

19. (Withdrawn) A membrane valve as in claim 17, wherein the two lines are positioned symmetrically with reference to a diametrical axis of the shutter disk.

20. (Withdrawn) A membrane valve as in claim 17, wherein the two lines are parallel but positioned asymmetrically with reference to a diametrical axis of the shutter disk.

21. (Withdrawn) A membrane valve as in claim 17, wherein the second means consist essentially of two stop ribs, said stop ribs being spaced from each other and said stop ribs being substantially in contact with the shutter disk.

22. (Withdrawn) A membrane valve as in claim 21, wherein the first means consist essentially of a primary clamping pin extending from the shutter disk and engaged in the opening on the valve seat, and wherein the two stop ribs are positioned symmetrically in relation to said primary clamping pin.

23. (Withdrawn) A membrane valve as in claim 21, wherein the first means consist essentially of a primary clamping pin extending from the shutter disk and engaged in the opening on the valve seat, and wherein the two stop ribs are positioned on asymmetrically opposite sides in relation to said primary clamping pin.

24. (Withdrawn) A membrane valve as in claim 21, wherein the first means consist essentially of a primary clamping pin extending from the shutter disk and engaged in the opening on the valve seat, and wherein the two stop ribs are positioned on the same side in relation to said primary clamping pin.

25. (Withdrawn) A membrane valve as in claim 21, wherein the first means consist essentially of two primary clamping pins extending from the shutter disk and engaged in two corresponding openings on the valve seat, and wherein the two stop ribs are not parallel to the line connecting said primary clamping pins.

26. (Withdrawn) A membrane valve as in claim 25, wherein the two stop ribs are positioned symmetrically in relation to the two primary clamping pins.

27. (Withdrawn) A membrane valve as in claim 25, wherein the two stop ribs are positioned asymmetrically in relation to the two primary clamping pins.

28. (Withdrawn) A membrane valve as in claim 21, wherein the first means consist essentially of two primary clamping pins extending from the shutter disk and engaged in two corresponding openings on the valve seat, and wherein the two stop ribs are positioned along lines intersecting the longitudinal axes of said primary clamping pins.

29. (Withdrawn) A membrane valve as in claim 21, wherein the first means consist essentially of two primary clamping pins extending from the shutter disk and engaged in two corresponding openings on the valve seat, and wherein the two stop ribs are positioned on lines parallel to the line connecting said primary clamping pins.

30. (Withdrawn) A membrane valve as in claim 21, wherein the two stop ribs have peripheral edges that are substantially in contact with the shutter disk and wherein said peripheral edges are tapered with rounded ends.

31. (Withdrawn) A membrane valve as in claim 21, wherein the stop ribs have peripheral edges that are substantially in contact with the shutter disk in a discontinuous fashion.

32. (Withdrawn) A membrane valve as in claim 21, wherein the two stop ribs consist each of two or more rod-shaped members.

33. (Withdrawn) A membrane valve as in claim 17, wherein the first means consist essentially of a primary clamping pin extending from the shutter disk and engaged in the opening on the valve seat, and wherein the second means consist two rows of secondary clamping pins situated along parallel lines, said secondary clamping pins being engaged in corresponding openings on the valve seat.

34. (Withdrawn) A membrane valve as in claim 17, wherein the first means consist essentially of two primary clamping pins engaged in two matching openings on the valve seat, and wherein the second means consist two rows of secondary clamping pins, each one of said rows of secondary clamping pins including one of said clamping pins.

35. (Withdrawn) A membrane valve as in claim 17, wherein the first means consist essentially of two primary clamping pins engaged in two matching openings on the valve seat, and wherein the second means along each one of the lines consist both of a stop rib and of a row of secondary clamping pins.

36. (Withdrawn) A membrane valve as in claim 17, wherein the first means consist essentially of two primary clamping pins engaged in two matching openings on the valve seat, and wherein the second means along each one of the lines consist essentially of a stop rib or of a row of secondary clamping pins.

37. (Withdrawn) A membrane valve as in claim 17, wherein the shutter disk is not

of circular shape, and wherein the second means are positioned along lines that do not include the longest diameter of said shutter disk.

38. (Withdrawn) A membrane valve as in claim 17, wherein the shutter disk is not of circular shape, and wherein the second means are positioned along lines that are parallel to the shortest diameter of said shutter disk.

39.-47. (Original)

48. (Withdrawn) A second stage pressure reducer as in claim 39, wherein:

the shutter disk of the membrane valve is surrounded by an outflow duct, one wall of said outflow duct consisting of a portion of the outer wall of the case and the remaining walls of said outflow duct consisting of a profiled member having different sections, said sections including a central section that can be opened to provide access to said membrane valve and further including head sections, each of said head sections having open ends to allow for the escape of the breathed gas;

said shutter disk is of elongated shape;

the first means consist essentially of two clamping pin extending from the shutter disk and engaged in matching openings on the valve seat;

the major axis of said shutter disk is oriented parallel to the longitudinal axis of said outflow duct; and

the second means comprise two stop rib extending from said central section to come substantially in contact with said shutter disk.

49. (New) A membrane valve comprising:

a valve case including a valve seat, the valve seat having an opening, one or more ribs extending across the opening;

a shutter disk manufactured from a flexible material, the shutter disk engaging one of the one or more ribs;

an outflow duct coupled to the valve case and enclosing the valve seat, flow communication between the valve seat and the outflow duct being controlled by a displacement of the shutter disk, the outflow duct having an openable central portion connected to a plurality of outflow peripheral portions; and

a retaining member extending from the central portion of the outflow duct, the retaining member causing a portion of the shutter disk to remain substantially in contact with the valve seat during fluid passage through the valve seat.

50. (New) The membrane valve of claim 49, wherein the retaining member is a stop rib.

51. (New) The membrane valve of claim 50, wherein the stop rib has a peripheral edge substantially in contact with the stop rib, and wherein the peripheral edge is square, tapered, beveled, or rounded.

52. (New) The membrane valve of claim 50, wherein the stop rib has a peripheral edge substantially in contact with the stop rib, and wherein the peripheral edge is continuous, discontinuous, toothed, or comb-shaped.

53. (New) The membrane valve of claim 49, wherein the shutter disk engages one of the one or more ribs by having a clamping pin extend from the shutter disk and engage a mating aperture in the rib.

54. (New) The membrane valve of claim 49, wherein the retaining member is aligned with one of the one or more ribs.

55. (New) The membrane valve of claim 49, further comprising an annular wall in the valve seat extending outwardly of the valve case, the annular wall surrounding the opening

on one side, a peripheral sealing lip extending from the shutter disk and engaging the annular wall when no fluid flows through the opening.

56. (New) The membrane valve of claim 49, wherein the coupling of the outflow duct with the valve case defines a tubular conduit, and wherein the tubular conduit extends laterally in relation to the valve seat.

57. (New) The membrane valve of claim 49, wherein the central portion is openable by being removable from the outflow peripheral portions.

58. (New) The membrane valve of claim 49, wherein the central portion is openable by being hinged to the outflow peripheral portions.

59. (New) The membrane valve of claim 49, wherein the shutter disk has an elongated shape, the elongated shape having the longest diameter oriented in a direction parallel to the longitudinal axis of the outflow duct.

60. (New) A second stage pressure reducer for two stage pressure regulators comprising:

a chamber for storing and delivering breathing gas to a diver;

an outlet connecting the chamber to a mouthpiece;

an inlet connecting the chamber to a first stage pressure reducer, the first stage pressure reducer being further connected to a high pressure source of the breathing gas;

a spring valve housed within the chamber, the spring valve regulating the inflow of the breathing gas into the chamber from the first stage pressure reducer, the spring valve being in an open condition when pressure within the chamber falls below a predetermined level and being in a closed condition otherwise; and

a membrane valve regulating the outflow of spent gas from the diver, the membrane valve being housed in the case and comprising,

a valve case including a valve seat, the valve seat having an opening, one or more ribs extending across the opening;

a shutter disk manufactured from a flexible material, the shutter disk engaging one of the one or more ribs;

an outflow duct coupled to the valve case and enclosing the valve seat, the coupling of the outflow duct with the valve case defining a tubular conduit, flow communication between the valve seat and the outflow duct being controlled by a displacement of the shutter disk, the outflow duct extending laterally in relation to the valve seat, the outflow duct further having an openable central portion connected to a plurality of outflow peripheral portions; and

a retaining member extending from the central portion of the outflow duct, the retaining member causing a portion of the shutter disk to remain substantially in contact with the valve seat during passage of the spent gas through the valve seat.

61. (New) The second stage pressure reducer of claim 60, wherein the retaining member is a stop rib.

62. (New) The second stage pressure reducer of claim 60, wherein the valve seat is situated in a planar portion of the valve case.

63. (New) The second stage pressure reducer of claim 62, wherein the planar portion is inclined in relation to the longitudinal axis of the mouthpiece.

64. (New) The second stage pressure reducer of claim 60, wherein the outflow peripheral portions direct the spent gas at an angle not perpendicular to the longitudinal axis of the mouthpiece.

65. (New) The second stage pressure reducer of claim 60, wherein the central portion is openable by being removable from the outflow peripheral portions.

66. (New) The second stage pressure reducer of claim 60, wherein the central portion is openable by being hinged to the outflow peripheral portions.